University of Pittsburgh Bradford | College in the High School

Concepts of Biology
BIOL 0091
3 credits

Description: A survey of biological concepts providing students with a good understanding of how biology relates to everyday life.

Prerequisite: None

Textbook: OpenStax *Concepts of Biology***.** Download for free at https://openstax.org/details/books/concepts-biology. Bound hard copy versions are also available for a modest cost. Other textbooks will be considered by the faculty liaison on a case-by-case basis.

The following topics should be covered in this course:

1. Foundations of biological chemistry (including types of bonds, pH, properties of water, characteristics of the major categories of macromolecules)
2. Cell structure and function
3. Bioenergetics (including enzymes, cellular respiration, and photosynthesis)
4. Mitotic and meiotic cell division
5. Foundations of genetics (including crosses that involve one or two genes, variations on dominance, inheritance of sex-linked traits, use of Punnett squares)
6. Molecular genetics (including DNA replication, transcription, RNA processing, translation, gene regulation)
7. Biotechnology (including gel electrophoresis, gene cloning, PCR, DNA sequencing, and transgenic organisms)
8. Evolutionary processes (including evolution by natural selection, microevolution processes (e.g. genetic drift, gene flow, etc…), macroevolution processes)
9. Foundations of taxonomy and phylogenetic trees
10. Survey of biodiversity in prokaryotes, protists, fungi, plants, and animals
11. Foundations of human body systems
12. Population ecology
13. Community ecology
14. Ecosystems and biosphere
15. Conservation and biodiversity

Course objectives:

- To be able to apply the scientific method to answer biological questions
- To be able to describe the Theory of Evolution and how evolution has given rise to the great diversity of life on Earth
- To be able to describe the major features of several important representative types of microbes, fungi, plants, and animals
- To be able to describe how living organisms use energy and how energy flows in ecosystems
- To be able to describe how the various components of cells contribute to their functioning
- To be able to describe how cells work together and communicate in a multicellular organism
- To be able to describe how cells and organisms reproduce
- To be able to apply the laws of genetics to predict how traits are passed down from one generation to the next
- To be able to describe how genetic information is utilized by the cell at the molecular level
- To be able to analyze how changes in allele frequencies contribute to evolutionary processes
- To be able to analyze how organisms interact with each other within their ecosystems
- To be able to describe how organisms are affected by their environment and how humans impact the environment

Grading: The final grade will be determined using a variety of assessment methods, including a final exam that is worth at least 10% of the total class grade.

Pitt Grading System:

All courses required to satisfy associate and baccalaureate degree requirements-including all courses required for a major, a minor, or general education-must be taken for letter grades, with the exception of those courses designated as graded S and NC only. Pitt-Bradford uses 13 earned letter grades. They are listed below with their equivalent quality point values.

A+	4.00
A	4.00 superior achievement
A-	3.75
B+	3.25
B	3.00 meritorious achievement
B-	2.75
C+	2.25
C	2.00 adequate achievement
C-	1.75
D+	1.25
D	1.00 minimal achievement
F	0.00 failure

Academic Integrity and Plagiarism: Members of a university community, both faculty and students, bear a serious responsibility to uphold personal and professional integrity and to maintain complete honesty in all academic work. Violations of the code of academic integrity are not tolerated. Students who cheat or plagiarize or who otherwise take improper advantage of the work of others face harsh penalties, including permanent dismissal. The academic integrity guidelines set forth student and faculty obligations and the means of enforcing regulations and addressing grievances.

Grades: Grade criteria in the high school course may be different from the University standards. A CHS student could receive two course grades, one for high school and one for the University transcript. In most cases, the grades are the same. Grading standards should be explained at the beginning of the course.

Transfer Credits: Grades earned in CHS courses appear on an official University of Pittsburgh transcript and the course credits may be eligible for transfer to other colleges and universities. Students should contact potential colleges and universities in advance to be sure their CHS credits will be accepted. If students will attend any University of Pittsburgh campus, grade earned in the course will count toward the student grade point average at the University. At the University of Pittsburgh, the CHS course supersedes any equivalent AP credit.

Drops and Withdrawals: Students should monitor their progress in a course. A CHS teacher can contact the program administrators to request a drop or withdrawal. Dropping or withdrawing from the CHS course has no effect on enrollment in the high school credits.